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10/702,049	11/06/2003	Noriaki Fukiage	FIS920060073US1 (RAJ-014)	7419

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James Klekotka
Suite 10
4350 W. Chandler Blvd.
Chandler, AZ 85226

EXAMINER	
TADAYYON ESLAMI, TABASSOM	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/702,049	FUKIAGE ET AL.	
	Examiner	Art Unit	
	Tabassom T. Tadayyon-Eslami	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 37 is objected to because of the following informalities: Claim 37 should depend on claim 36 not claim 38 for proper antecedent basis for "the shower plate". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term " small foot" is not defined in the specification and is a relative term.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1- 5, 10, 15-17, 19- 21, 23, 27-29 and 31-33are rejected under 35 U.S.C. 102(b) as being anticipated by M. Angeopoulos et. al. (U. S. Patent: 6316167, here after 167).

Claim 1 is rejected. 167 teaches,

a method for depositing a material on a substrate, comprises,

placing a substrate in a chamber having a plasma source and on a substrate holder [column 9 line 65];

depositing a TERA layer on the substrate [column 8 line 58, (SiCH)], wherein a processing gas comprising a precursor is provided to the chamber [column 8 line 54, column 8 line 59]; exposing the TERA layer to a post-processing plasma (wherein a photoresist-compatible surface is created on the TERA layer) [column 8 lines 49-54 and column 12 lines 60-62, (in fact the first layer is considered TERA layer deposition and the deposition of the second layer via plasma processing is considered a post plasma treatment to create a photoresist compatible surface). The created layers have good photoresist compatibility [column 10 lines 66-67].

Claim 2 is rejected. Since the application is to fabricate IC's and in nm size, [column 1 lines 1-3, column 1 lines 29-33], therefore the photoresist features should be about nm and are very small.

Claim 3 is rejected. 167 teaches forming plurality of photoresist features on the photoresist compatible surface and she further teaches the feature comprises a well defined rectangle profile [fig. 10].

Claim 4 is rejected. 167 teaches limitation of claim 1 and it further teaches the layers (and therefore the post –processing plasma) may be formed using oxygen containing gas [column 8 lines 66-67].

Claim 5 is rejected. 167 teaches limitation of claim 1 and it further teaches creating the post –processing plasma (second layer deposition) using oxygen containing gas with flowing rate 2 sccm [column 8 line 68].

Claim 10 is rejected. 167 teaches,

a method of depositing material on a substrate wherein the depositing TERA layer during a depositing time comprises a material having a refractive index (n) of 2.1 and extinction coefficient of 0.5 [column 12 line 58-59, first layer] measured at the wavelength of 248 nm [column 12 lines 30 and 64].

Claims 15, 17 are rejected. 167 teaches the limitation of claims 10 and she further teaches the process gas comprises silicon and carbon containing precursor (tetramethylsilane) [column 8 line 59].

Claim 16 is rejected. 167 teaches silicon containing and carbon containing precursor with the rate of 10 sccm [column 8 line 60].

Claims 20 and 21 are rejected. 167 teaches controlling the pressure of the chamber and the pressure in the range of 0.2 torr [column 8 line 61].

Claim 23 is rejected. 167 teaches limitation of claim 1 and she further teaches depositing a top portion of the TERA layer, wherein the top portion comprises a material having a refractive index of 1.9 and extinction coefficient of 0.25, when measured at a wavelength of 248 nm [column 12 line 61].

Claims 27 and 28 are rejected. 167 teaches limitation of claim 23 and she further teaches the process gas comprises silicon, carbon, oxygen and argon containing gas [column 9 line 21].

Claim 29 is rejected. 167 teaches the precursor flowed with the rate of 10 sccm [column 8 line 59] and the inert flowed with the rate of 30sccm [column 9 line 22].

Claims 19 and 31 are rejected. 167 teach the limitation of claims 15 and 27 and she further teaches the inert gas to be argon [column 9 line 21].

Claims 32-33 are rejected. 167 teaches the limitation of claim 1 and she further teaches controlling the substrate temperature at 60 °C [column 8 line 62].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 7, 9, 11-12, 18 and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over M. Angeopoulos et. al. (U. S. Patent: 6316167, here after 167) further in view of Houng T. Nguyen et. a. (U. S. Patent application: 2003/0017694, here after 694).

Claim 7 is rejected. 167 teaches limitation of claim 1, as discussed in the 35 U.S.C. 102(b) rejection above, and it further teaches an inert gas is employed during the creation [column 9 line 21]. 167 does not specifically teaches the flow rate of the inert gas to be 0-10000 sccm. 694 teaches a method of deposition of organosilicate layers [abstract lines 1-2] wherein the inert gas [0054 lines 4-7]

has the flow rate of 10 sccm to about 10000 sccm [0055 lines 8-10]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of deposition of TERA layer in which the flow rate of the inert gas is 10 sccm to about 10000 sccm, because 694 teaches it is a suitable amount for flow of the inert gas.

Claim 9 is rejected. 167 teaches a method of deposition a TERA layer (comprises Si, C, O, H) [column 4 lines 12-24] on a substrate. 167 does not specifically teach the deposition time for the second deposition step. 694 teaches a method of deposition of organosilicate layers [abstract lines 1-2, 0064 lines 2-5] were the deposition rate is about 20000 A/min [0064 lines 3-5 and 0055 lines 13-14]. He further teaches the thickness of the layer is about 5000 A; therefore the deposition time is about 15 sec. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of deposition of TERA layer in which the deposition time for the TERA layer is about 15 second, because 694 teaches within this time the thickness of the TERA layer is appropriate.

Claim 11 is rejected. 167 teaches a method of deposition a TERA layer (comprises Si, C, O, H) [column 4 lines 12-24] on a substrate. 167 does not specifically teach the deposit rate of the bottom portion of the TERA layer is about 100-10000 A/ min. 694 teaches a method of deposition of organosilicate layers [abstract lines 1-2] wherein the deposit rate of the organosilicate material is in the range of 1000-20000 A/ min [0055 lines 12-14]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made

to have a method of deposition of TERA layer in which the deposition rate of the TERA layer is 100-10000 A/ min, because 694 teaches it is suitable to deposit TERA layer with these deposition rate.

Claim 12 is rejected. 167 teaches a method of deposition a TERA layer (comprises Si, C, O, H) [column 4 lines 12-24] on a substrate. 167 does not specifically teach the deposition time for depositing the bottom layer is between 5-18 seconds. 694 teaches a method of deposition of organosilicate layers [abstract lines 1-2] wherein the deposit rate of the organosilicate material is 20000 A/ min [0055 lines 12-14]. He further teaches the thickness of the layer is about 3000 A [0057 lines 4]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of deposition of TERA layer in which the deposition time of the bottom TERA layer is about 9 sec, because 694 teaches within this time the thickness of the TERA layer is appropriate.

Claim 18 is rejected. 167 teaches a method of deposition a TERA layer (comprises Si, C, O, H) [column 4 lines 12-24] on a substrate which meets the limitation of claim 15 as discussed above. 167 does not specifically teach the processing gas comprises CH_4. 694 teaches a method of deposition of organosilicate layers [abstract lines 1-2] wherein the processing gas comprises CH_4 [0053 line 3]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of deposition of TERA layer in which the processing gas comprises CH_4, because 694 teaches methane is a suitable gas for deposition of organosilicate layer.

Claim 25 is rejected for the same reason claim 11 is rejected [also see 0064 lines 2-5].

Claim 26 is rejected for the same reason claim 12 is rejected [also see 0064 lines 2-5].

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over M. Angeopoulos et. al. (U. S. Patent: 6316167, here after 167), further in view of A. Grill, Journal of Applied Physics, Vol. 93 (2003) 1785-1790, here after Grill. 167 teaches limitation of claim 27, as discussed in the 35 U.S.C. 102(b) rejection above. 167 does not teach the precursor comprises TMCTS. Grill teaches a method for depositing SiCOH by PECVD when the precursor is TMCTS [column 2 line 4 and 27, page 1785] (mixing with inert gas (column 1 line 6 page 1786). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method for depositing SiCOH film via PECVD that 167 teaches when the precursor is TMCTS, because Grill teaches it is suitable to use TMCTS for depositing SiCOH film via PECVD process.

Claims 6, 8, 13-14 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over M. Angeopoulos et. al. (U. S. Patent: 6316167, here after 167) further in view of Seon Mee Cho et. al. (U. S. Patent Application: 2003/0003768, here after Cho).

Claim 6 is rejected. 167 teaches a method of deposition a TERA layer (comprises Si, C, O, H) [column 4 lines 12-24] on a substrate which meets the limitation of claims 1 and 10 as discussed above. 167 also teaches employing a hydrogen containing gas with the rate of 0 sccm (no hydrogen gas), He does not

teach the hydrogen containing gas is H_2O. Cho teaches a method of deposition of organosilicate layers [0016 lines 1-4] wherein the gas comprises H_2O [0032 line 7] inorder to increases reactivity and achieve desire carbon contain in the film. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of deposition of TERA layer in which the hydrogen containing gas comprises H_2O, because Cho teaches H_2O increases reactivity and achieve desire carbon contain in the film.

Claims 8,13 and 24 are rejected. 167 teaches a method of deposition a TERA layer (comprises Si, C, O, H) [column 4 lines 12-24] on a substrate which meets the limitation of claims 1, 10 and 24 as discussed above. 167 does not specifically teach the plasma source has a RF source. Cho teaches a method of deposition of organosilicate layers [0016 lines 1-4] wherein the plasma source (11) has a RF source in a power range of 10 watt/ cm^2 to about 200 watt/ cm^2 [0038, lines 3-5] frequency of 13.56 MHz [0037 lines 5-6 and 11-15]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of deposition of TERA layer in which the plasma source has a RF has the power of 1 watt/ cm^2 to about 500 watt/ cm^2, 13.56 MHz frequency, because Cho teaches it is suitable to deposit TERA layer with having RF plasma source.

Claim 14 is rejected. 167 teaches a method of deposition a TERA layer (comprises Si, C, O, H) [column 4 lines 12-24] on a substrate which meets the limitation of claims 1 and 10 as discussed above. 167 does not specifically teach the substrate holder is coupled to a RF source. Cho teaches a method of

deposition of organosilicate layers [0016 lines 1-4] wherein the substrate holder (12) [0035 lines 11-13] is coupled to a second RF source [00033 lines 8-23] of 0.3-3.2 watt/ cm^2 [0035 lines 12-13] and frequency of 0.1-200 MHz [0033 lines 16-17]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of deposition of TERA layer in which the plasma source has a RF has the power of 0.3-3.2 watt/ cm^2 and frequency of 0.1-200 MHz, because Cho teaches it is suitable to deposit TERA layer with having RF plasma source.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over M. Angeopoulos et. al. (U. S. Patent: 6316167, here after 167) further in view of Craig A. Roderick (U. S. Patent: 6074488, here after 488). 167 teaches the limitation of claim 10 as discussed in the 35 U.S.C. 102(b) rejection above.167 does not teach the DC voltage is applied to an electrostatic chuck. 488 teaches a method of plasma deposition [column 10 lines 42-46] where a DC voltage applied to the electrostatic chuck [column 2 lines 58-60]. He further teaches the DC voltage is about 200-2000 Volts [claim 32]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of plasma deposition wherein the DC voltage to an electrostatic chuck of about 200-2000 Volts to hold the substrate and generate plasma, because 488 teaches it is desirable to deposit material on a surface by such a plasma processing to eliminate extraneous components [column 2, lines 55-65] .

Claims 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over M. Angeopoulos et. al. (U. S. Patent: 6316167, here after 167) further in

view of Tae K. Won (U. S. Patent Application: 2003/0044621, here after Won). 167 teaches a method of deposition a TERA layer (comprises Si, C, O, H) [column 4 lines 12-24] on a substrate which meets the limitation of claim 1, as discussed in the 35 U.S.C. 102(b) rejection above, 167 does not teach controlling the chamber wall temperature. Won teaches a method of deposition of organosilicate layers [abstract lines 7-9] wherein where the chamber wall temperature is controlled [0051 lines11 to the end] in order to obtain uniform film [claim 2 lines 7-10], he further teaches the temperature is between 380-410 °C [claim 2 line 9-10]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of deposition of TERA layer in which chamber wall temperature is controlled and is between 380-410 C, because Won teaches the deposited film will be uniform with controlling the chamber temperature between 380-410 C.

Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over M. Angeopoulos et. al. (U. S. Patent: 6316167, here after 167) further in view of Zheng Yuan (U. S. Application: 2002/0163028, here after Yuan). 167 teaches the limitation of claim 1, as discussed in the 35 U.S.C. 102(b) rejection above. She further teaches a shower head assembly is coupled to the chamber [120 fig. 2 and 0027 lines 3-5], She does not specifically teaches the temperature of the showerhead. Yuan teaches a method for depositing film on a substrate [abstract lines 1-2, 0007 lines 1-4], where the temperature of showerhead is about 90-120 C [0040 lines 3-12], to enhance the reaction time between the species. Therefore it would have been obvious to one of ordinary skill in the art at the time of

invention was made to have a method of deposition of TERA layer in which the showerhead temperature is controlled and is between 90-120 C, because Yuan teaches it enhance the reaction time between the species.

Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over M. Angeopoulos et. al. (U. S. Patent: 6316167, here after 167) further in view of Enzo Carollo (U. S. Patent Application: 2004/0137169, here after Carollo). 167 teaches the limitation of claim 1, as discussed in the 35 U.S.C. 102(b) rejection above, 167 does not teach de- chucking the substrate while the post plasma processing is being created. Carollo teaches a method of plasma deposition of silicon nitride [abstract lines 1-3], where a layer of oxide will deposit after deposition of silicon nitride [0034]. He further teaches de-chucking the substrate while generating the post processing plasma (oxygen) [claim 10]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of deposition of TERA layer that 167 teaches where de-chucking the substrate while the post plasma processing is generated, because Carollo teaches it is suitable to have the substrate de-chuck during the generation of post processing plasma.

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over M. Angeopoulos et. al. (U. S. Patent: 6316167, here after 167) and Enzo Carollo (U. S. Patent Application: 2004/0137169, here after Carollo) as applied to claim 38 above, further in view of Zheng Yuan (U. S. Application: 2002/0163028, here after Yuan). 167 and Carollo teach the limitation of claim 38, as discussed above. 167 further teaches a shower head assembly is coupled to the chamber [120 fig.

2 and 0027 lines 3-5], 167 does not specifically teaches the temperature of the showerhead. Yuan teaches a method for depositing film on a substrate [abstract lines 1-2, 0007 lines 1-4], where the temperature of showerhead is about 90-120 C [0040 lines 3-12], to enhance the reaction time between the species. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of deposition of TERA layer in which the showerhead temperature is controlled and is between 90-120 C, because Yuan teaches it enhance the reaction time between the species.

Claims 40 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over M. Angeopoulos et. al. (U. S. Patent: 6316167, here after 167) further in view of Yuan-Ko Hwang et. al.,(U. S. patent: 6238160, here after Hwang).

167 teaches the limitation of claim 1, as discussed in the 35 U.S.C. 102(b) rejection above, 167 does not teach de-chucking the substrate after the post plasma processing is extinguished. Hwang teaches a method of transporting the electrostatically chucking wafers for plasma processing [column 2 lines 43-45] where the de-chucking of the wafer happens after the plasma is extinguished [column 5 lines 61-65 and column 6 lines 1-3] to eliminate the negative charge from the wafer. He further teaches after that the lifter will raise the wafer [column 6 lines 3-6]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of deposition that 167 teaches where de-chucking the substrate is taught by Hwang and happens after the plasma processing is extinguished and lifting the substrate happens after the

plasma processing is extinguished, because Hwang teaches de-chucking the substrate helps to remove the negative charges on the substrate.

Claims 41-42 is rejected under 35 U.S.C. 103(a) as being unpatentable over M. Angeopoulos et. al. (U. S. Patent: 6316167, here after 167) further in view of Dan Maydan et. al. (U. S. Patent: 4951601, here after Maydan). 167 does not teach lifting the substrate before the post processing plasma is created. Maydan teaches a multi-chamber for processing the semiconductor wafers [abstract lines 1-2] comprises a robot, which load and unload the wafers [abstract lines 7 and 10-12]. He further the multi-chambers can be used for different processing such as deposition sputtering, etching and...[abstract lines 12-17]. Considering two-deposition process in two different chambers, the wafer is lifted by a robot to transfer from the first chamber to the second chamber [column 7 lines 26-28], before the post plasma deposition created from the second chamber. The wafer also is transferred from one deposition chamber to another chamber while the plasma is being crated in the third chamber (claim 41 rejection). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of deposition that 167 teaches where the deposition happened in Maydan's multiple processing chamber, because Maydan teaches the multiple processing chamber is suitable for processing the semiconductor wafers.

Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over M. Angeopoulos et. al. (U. S. Patent: 6316167, here after 167) further in view of Enzo Carollo (U. S. Patent; 6953609, here after Carollo) and S. Avanzino, et. al.

(U. S. Patent: 5776834, here after 834). 167 teaches the limitation of claim 1, as discussed in the 35 U.S.C. 102(b) rejection above, 167 does not teach de-chucking the substrate before the post processing plasma is created. Carollo teaches a method of plasma deposition of silicon nitride [abstract lines 1-3], where the electrostatic chuck holds the substrate [0021 lines 1-3] and chucking and de-chucking of the substrate happens by applying or removing the direct voltage to the chuck [0021 lines 9-10]. 834 teaches a method of deposition insulating layers [title, column 2 lines 67-68 and column 6 lines 50-52] where the bias to the substrate [column 3 lines 37-38] is off [column 6 lines 63-65], which means the wafer is de-chucked, before the plasma is created. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of deposition that 167 teaches where the substrate is de-chucked before the plasma is created, because 834 teaches it is suitable method for plasma deposition of materials.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tabassom T. Tadayyon-Eslami whose telephone number is 571-270-1885. The examiner can normally be reached on 7:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

T.T

KATHERINE BAREFORD
PRIMARY EXAMINER